

Effect of Playing Interactive Computer Game on Distress of Insulin Injection Among Type 1 Diabetic Children

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Background: Diabetic children and their families experience high level stress because of daily insulin injection.

Objectives: This study was conducted to investigate the impact of an interactive computer game on behavioral distress due to insulin injection among diabetic children.

Patients and Methods: In this clinical trial, thirty children (3-12 years) with type 1 diabetes who needed daily insulin injection were recruited and allocated randomly into two groups. Children in intervention groups received an interactive computer game and asked to play at home for a week. No special intervention was done for control group. The behavioral distress of groups was assessed before, during and after the intervention by Observational Scale of Behavioral Distress-Revised (OSBD-R).

Results: Repeated measure ANOVA test showed no significant difference of OSBD-R over time for control group ($P = 0.08$), but this changes is significant in the study group ($P = 0.001$). Comparison mean score of distress were significantly different between two groups ($P = 0.03$).

Conclusions: According to the findings, playing interactive computer game can decrease behavioral distress induced by insulin injection in type 1 diabetic children. It seems this game can be beneficial to be used alongside other interventions.

Keywords: Children; Insulin; Injection; Computer Game

1. Background

Injection is a main source of fear, pain, anxiety and may lead to different levels of distress among children (1, 2) particularly who should have aggressive treatment like frequent injections resulting from chronic conditions (3, 4).

Type 1 diabetes (T1D) is one of the most common chronic diseases in childhood (5). Children diagnosed with T1D should be treated with multiple daily insulin injections (6, 7). Rzeszut (2011) reported that fear and anxiety due to insulin injection are common in children with T1D (8). Howe et al. have shown that 40.9% of children with T1D had fear of insulin injection and 75% of children below 9 years old experienced higher fear in the starting of insulin therapy (9).

A similar study by Antal et al. (10) showed that half of parents had a history of diabetes-related injection distress in their children such as verbal resistance, whine, refuse to come into the room or get proper position for the injection, squirm to escape. Also common child's behaviors during first month after diagnosis were upset, angry, and unhappy.

Insulin therapy is main treatment of T1D (6, 7). If children with T1D cannot cope with these daily injections,

the distress and anxiety due to injections will affect their daily life. This distress may influence children's cooperation while injecting, hence they will experience poor treatment, higher HbA1c level, negative attitude toward diabetes (8, 9).

There are no enough interventions and studies about relieving distress in children with T1D. Study of Sewell (2004) have shown that education of deep breathings and relaxation techniques are effective to decrease anxiety-related self-injections in adolescents with T1D (11). Some studies have also indicated that show films like "peer modeling film" may affect insulin self-injection learning but no effect on reducing anxiety (12). Slifer et al. showed that parent-training interventions such as use of electronic toy, verbal and written descriptions, modeling, role playing, and other behavioral strategies are not effective to decrease children distress of needle procedures (13).

In recent years, computer game has become an attractive and enjoying entertainment among children and adolescents (14-16). Some researchers believe that computer and video games can be effective to improve health-related